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Application for examination pursuant to §44 of the Patent Act has been filed.

54 Method and device for attaching suspension elements to sausages

57 The invention relates to a method for attaching suspension loops (14) or similar suspension elements to sausages, in particular in which the suspension element (14) is supplied to a constricting device (18) and the tube- or net-shaped skin of the sausage is filled, and the sausage is constricted after filling and closed by means of a closure device (48), while the suspension element (14) is simultaneously secured in the region of constriction of the sausage, as well as to a device for executing the method. To create a method and a device that simplify and facilitate supplying the suspension element, it is provided that the suspension element (14) is fed into the path of the closure device (48) through an opening (42) disposed outside the working region of the constricting device (18).

[see original for figure]

Specification

The invention relates to a method for attaching suspension loops or other suspension elements to sausages and the like in which the tube- or net-shaped skin of the sausage is filled, the sausage is constricted after being filled and is closed by a closure device, especially a clamp, and the suspension element is simultaneously attached in the region of the constriction of the sausage.

Such a method and a corresponding device for attaching suspension elements to sausages is already known from DE-OS 34 30 030.The device has a constricting tool with an upper and a lower arm of V-shaped displacement shears. Prior to the sausage filling process, a loop is fed into an opening between the displacement shear arms, where it is held by a rod that engages the suspension loop. Following the sausage filling process, the sausage skin is constricted by the displacement shear arms. In this process, the loop is fed through the diagonal edges of the V-shaped shear arms to the central longitudinal axis of the constricting tool, where it is clamped into place with a locking clamp.

Although the known device allows for the use of constricting and/or displacement tools whose inside diameter in the opened state can be smaller than the sausage caliber, the sausage being forced through the tool during the filling process rubs against the loop and pulls it along. In addition, the separation of the loops from a conveyor belt strip is problematic. Finally, the mechanical structure of the device is relatively complex, because a moveable rod and a corresponding drive device and drive control are needed in addition to hold the loop between the displacement shear arms.

The goal of the invention is to make a make available a method that, with a reduction in the complexity of the equipment, guarantees the trouble-free feeding of the suspension elements.

This goal is achieved, according to the invention, in that the suspension element is fed into the path of the closure device outside the working region of the constricting tool and is supplied together with the closure device to the constriction.

The advantage of the invention is that the suspension element is fed into a region in which it does not contact the sausage before the closure operation and in which it does not interfere with the operation of the constricting tooling. This allows for clean and simple feeding and attachment of the suspension element to the constriction of the sausage.

It is especially advantageous if the suspension element protruding into the path of the closure device is positively gripped by the closure device and pulled from a conveyor belt. In this manner, no additional means are necessary to transport the suspension element to the attachment site. At the same time, the suspension element can be reliably and easily pulled away from the conveyor belt by the closure device. Because sausages normally have a suspension element at only one end, it is advantageous, in a manner known in the art, to provide two plunger channels axially behind one another and,

between the channels, a cutting device as well as a feeding device that feeds suspension elements into one of the plunger channels only. This ensures that one end of a sausage is closed with only one closure device, whereas the other end is closed and simultaneously provided with a suspension element.

The goal of the invention is also to make available a device for executing the method according to the invention, which is structured simply and cost effectively, and ensures trouble-free feeding of suspension elements.

This goal is achieved with a device having a constricting device with a constricting tool and a plunger channel for supplying closure devices, as well as having a feeding device for suspension elements, in that the feeding device is disposed adjacent to the constricting device in such a way that the suspension elements can be inserted into the plunger channel by the feeding device through an opening disposed outside the working region of the constricting tool. In this connection, no additional means are needed to hold the suspension elements. For this reason, the device according to the invention can be structured more simply in comparison to the state of the art and can be produced in an especially cost-efficient manner.

In a preferred embodiment of the invention, the constricting device has a locking plate with a feed slit opening into the plunger channel. In this regard, the suspension element is fed through the feed slit of the constricting device in such a way that the closure device, generally designed as a clamp, engages the suspension element and carries it to the constriction site.

In this connection, it can be especially advantageous if the feeding device is disposed at an acute angle to the locking plate. The advantage of the angled arrangement is that the sausages can be easily fed to the device and removed again.

If the distance between the feed slit and the constriction site corresponds to at least the length of the suspension element, it can be fully and cleanly pulled away from its conveyor belt.

The insertion of the suspension elements into the feed slit is significantly facilitated by the fact that its height at the feed point at which the suspension element is inserted into the feed slit is several times the height of the suspension element. Preferably, however, the feed slit should taper in the direction of the plunger channel, so that channeling of the closure clamps in the plunger channel is only interrupted on the one side of said plunger channel and only briefly.

Finally, it can be provided that, in addition to the feed slit, an adjustable stripper is provided for the suspension elements. As a result of the stripper, which may have a sharp edge pointing in the direction of the feeding device, the separation of the suspension elements from a belt-shaped conveyor device is guaranteed. The adjustability of the stripper facilitates the insertion of a new conveyor belt.

Other goals, characteristics and application possibilities of the present invention result from the description of exemplary embodiments on the basis of the drawing. In this context, all described and/or depicted characteristics, either alone or in any reasonable combination, constitute the object of the invention, even independently of their summary in the claims or their reference [to the claims].

Fig. 1 shows a schematic, perspective view of the device according to the invention;

Fig. 2 shows the locking plate of the development according to Fig. 1, in a frontal view; and

Fig. 3 shows a horizontal section through the locking plate according to Fig. 2 and, in a top view, a conveyor belt with suspension loops.

The device 10 has a supply roll, which is not shown, with a conveyor belt 12, to the underside of which suspension elements formed as suspension loops 14 are attached, preferably glued or provisionally fastened. The conveyor belt 12 with suspension loops 14 is fed over a deflection roller 16 and another deflection roller 20 disposed in the region of the constricting device 18. A clamping device labeled, in its totality, with the reference number 22, and having a lower, moveable clamping jaw 24 and an upper, fixed clamping jaw 26, is disposed between the deflection rollers 16, 20. The conveyor belt 12 is fed between the clamping jaws 24, 26. In the exemplary embodiment shown, the lower clamping jaw 24 is actuated by means of a piston-cylinder drive 28.

Following upward and backward deflection of the conveyor belt 12 at the deflection roller 20 and removal of the individual suspension loops 14, which will be discussed in greater detail below, the conveyor belt is fed between the clamping jaws 24, 26 to a preference roller 30. The preference roller 30 is driven by a drive, which is not shown, and has a plurality of protrusions 32 on its circumferential surface to engage the conveyor belt 12 released by the suspension loops 14. Following a further deflection, if applicable, the empty conveyor belt 12 is reeled onto a take-up reel, which is not shown. Instead of the deflection roller 20 mentioned above, a simple, fixed deflection rod can be provided.

The constricting device 18 includes, in a manner known in the art, a so-called locking plate 34. In the exemplary embodiment, it has an outwardly expanding insertion slit 36 for insertion of a sausage, said insertion slit merging into a plunger channel 38. The plunger channel 38 is open at the top and is delimited on the bottom by a die plate 40. A feed slit 42 is located above the opening of the insertion slit into the plunger channel 38, as is particularly evident in Fig. 2. The feed slit 42 also opens into the plunger channel 38, whereas the end of the feed slit 42 facing away from the plunger channel 38 is closed. The height of the feed slit 42 is several times the height of the suspension loops 40. The feed slit 42 tapers in the region of the opening of the slit 42 into the plunger channel 38. Instead of the horizontal arrangement of the feed slit 42 in accordance with Fig. 2, a configuration angled toward the plunger channel 38 can also be provided. A curvature 44 is provided at the transition from the feed slit 42 into the plunger channel 38.

A compressed air cylinder 46 with a plunger 35, which is only indicated in the drawing, is disposed above the locking plate 34. Locking devices formed as clamps 48 in this exemplary embodiment are transported through the plunger channel 38 by the plunger of the compressed air cylinder 46. To this end, as is visible in Fig. 1, clamps 48 from the rear of the locking plate 34 are fed into the plunger channel 38. The feed point for the clamps 48 is located above the opening of the feed slit 42 into the plunger channel 38.

In addition, a table 50 for supporting a sausage, or the like, to be closed, is attached behind the locking plate.

For reasons of clarity, the actual sausage-filling machine is not shown in Fig. 1.

As is especially visible in Fig. 2 and 3, the plunger channel 38 has two guide grooves 52, 54, which are indicated by dashed lines in Fig. 2. The guide groove 52 is interrupted at the opening of the feed slit 42 into the plunger channel 38, while the guide groove 54 is interrupted at the opening of the insertion slit 36 into the plunger channel 38. To ensure adequate channeling of the clamps 48, the width of the junctions should be less than the length of the arms of the clamps.

A view along the intersection line III-III in Fig. 2 is visible in Fig. 3. In this connection, the conveyor belt 12 is adjacent to the locking plate 34. It belongs together with the corresponding drive, the deflection rollers and other means for the feed device, which is not described. The conveyor belt 12 is disposed at an acute angle α relative to the surface of the locking plate 34. A clamp 48 is disposed in the grooves 52, 54, of which clamp, however, only the sectioned jaws are visible in Fig. 3. A suspension loop 14, its one end in the feed slit 42, juts from the conveyor belt 12, while the other end of the suspension loop 14 is provisionally fastened at several points to the conveyor belt 12. The fastening points are labeled with the reference number 56. The end of the suspension loop 14 jutting into the feed slit 42 extends into the plunger channel 38 and between the jaws of the clamp 48. The deflection roller 20 is followed by a rod 57, which has a sharp edge pointing in the direction of the conveyor 12. The rod 57 is designed to pivot away from the conveyor belt 12. In addition to the pair of guide grooves 52, 54, a further pair can be provided axially adjacent to the first pair.

To attach the suspension loops 14 and close a sausage, the sausage, which is not shown, is first inserted into the insertion slit 36 of the locking plate 34, said insertion slit tapering inward from the exterior and serving here as a constricting tool, and moved downward along the plunger channel 38, until the constricted sausage lies on the die plate 40. Instead of a so-called endless sausage, pre-made sausages or tubular chains can be constricted in net-shaped skins. At the same time, or subsequently, a suspension loop 14 is inserted into the feed slit 42 via the conveyor belt 12 until the position shown in Fig. 3 is reached. The end of the suspension loop that has been separated from the conveyor belt now juts simultaneously into the feed slit 42 and the plunger channel 38. Then the compressed air cylinder 46 with plunger is actuated and a clamp 48 is moved downward into the guide grooves 52, 54 of the plunger channel 38. In this process, the clamp 48 engages the suspension loop 14 and detaches the still-connected end of the loop 14 from

the conveyor belt 12. The downward motion of the plunger, together with the clamp 48 and the suspension loop 14, now fully separated from the conveyor belt 12, continues until the clamp reaches the die plate and is bent. In this process, the tube- or net-shaped skin of the sausage is closed, while, at the same time, clamp 48 holds the loop onto the skin of the sausage. During the separation of the suspension loop 14 from the conveyor belt 12, the lower moveable clamp jaw 24 closes. The tensile forces occurring in this process are absorbed by the closed clamping device.

The other end of the skin of the sausage is also closed in the manner described above. However, a suspension loop 14 is not supplied in this constriction process.

Instead of the tilted feed at an acute angle α described above, the suspension loop 14 can also be fed to the surface of the locking plate at a right angle, specifically, in all cases, from each side of the locking plate. The invention is also independent of the manner in which the sausage is constricted. Thus, for example, instead of the locking plate 34 shown, with a tapering, fixed insertion slit 36 according to DE-OS 34 30 030, displacement shear arms or a flap can be provided, by means of which the sausage or a tube- or net-shaped skin is constricted at the end of an object packaged therein, such as a gathered tubular chain for sausage production.

Claims

1. Method for attaching suspension loops or similar suspension elements to sausages and the like in which the tube- or net-shaped skin of the sausage is filled, the sausage is constricted after being filled and is closed by a closure device, especially a clamp, and the suspension element is simultaneously attached in the region of the constriction of the sausage, **characterized in that** the suspension element (14) is fed into the path of the closure device (48) outside the working region of a constricting tool and, together with said closure device, fed to the constriction site.

2. Method according to Claim 1, characterized in that the suspension element (14) jutting into the path of the closure device (48) is positively gripped by the closure device (48) and pulled from a conveyor belt (12).

3. Method according to Claims 1 or 2, characterized in that the suspension element (14) is disposed at an acute angle (α) to a transverse plane through the sausage at the constriction site.

4. Device for executing the method according to one of Claims 1 to 3, comprising a constricting device with a constricting tool and a plunger channel for feeding closure devices as well as with a feed device for suspension elements, characterized in that the suspension elements can be inserted from the feed device (12) into the plunger channel (38) through an opening (42) disposed outside the working region of the constricting tool (18).

5. Device according to Claim 4, characterized in that the constricting device has a locking plate (18) with a feed slit (42) for the suspension elements (14) opening into the plunger channel (38).

6. Device according to Claim 4 or 5, characterized in that the feed device (12) is disposed at an acute angle (α) to the locking plate (18).

7. Device according to one of Claims 4 to 6, characterized in that the distance between the feed slit (42) and the constriction site corresponds to at least the length of the suspension elements (42).

8. Device according to one of Claims 4 to 7, characterized in that the height of the feed slit (42) at the feed point at which the suspension element (14) is inserted into the feed slit (42) is several times the height of the suspension element (14).

9. Device according to one of Claims 5 to 18 [*sic*], characterized in that the feed slit (42) tapers toward the plunger channel (38).

10. Device according to one of Claims 4 to 9, characterized in that, in addition to the feed slit (42), a stripper (57), adjustable if necessary, is provided for separating the suspension elements (14) from the conveyor belt (12).

3 page(s) of drawings included

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FIG. 1 [see original for figure]

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FIG. 2 [see original for figure]

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FIG. 3 [see original for figure]